

METHOD FOR FORMING COMPOUND SEMICONDUCTOR LAYER

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Abstract

PURPOSE: To form a compound semiconductor layer having flat surface and prescribed thickness exclusively in a prescribed region by forming a silicon single crystal substrate covered with an insulation layer having an opening at a prescribed position and carrying out selective epitaxial growth of a compound semiconductor layer on the substrate surface exposed in the above opening using an ALE process.

CONSTITUTION: A silicon single crystal substrate 1 has a surface covered with an insulation layer 2 (e.g., SiO₂ layer) having an opening 8 at a prescribed position. The substrate is placed in a vapor growth apparatus and heated at a prescribed temperature. Raw material gases containing individual elements for constructing the desired compound semiconductor layer are introduced into the vapor growth apparatus staggering the introduction time. The above compound semiconductor layer 6 can be selectively deposited by epitaxial growth on the surface of the silicon single crystal substrate 1 exposed in the opening 8. A single crystal layer having a thickness of about 3μm which is required to form a semiconductor device can be produced by selectively depositing a single crystal layer 7 on the above semiconductor layer 6 by a vapor growth process which gives a high-purity single crystal at high rate of growth.